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LINCOLN UNIVERSITY

---------- **Department of Computer Science** ---------

Course Syllabus

COURSE TITLE:	Operating Systems with Linux	COURSE NUMBER:	CSC-3055
CREDIT HOURS:	4	PREREQUISITE(S):	CSC-2054
TERM:	Fall 2024	CO-REQUISITE(S):	None
COURSE METHOD:	Lecture + Lab	MEETING DAY AND TIME:	T/Th 4:00 PM - 5:40 PM
INSTRUCTOR:	Dr. Olamide T. Tawose *[Dr. Tawose]*	CLASSROOM LOCATION:	Nelson Sci. Bldg. 250
OFFICE LOCATION:	Nelson Sci. Bldg. Room 338	EMAIL:	otawose@lincoln.edu
OFFICE HOURS:	**W** 9:00-12:00, 1:00-4:00pm **Thurs** 8:25-9:25 am (on Zoom by appointment)	PHONE EXTENSION:	484-365-7730

COURSE DESCRIPTION:

This course introduces students to the principles and concepts of modern operating systems design, discusses major issues of importance in the design, and shows how operating systems have implemented the design ideas. Topics include process management, CPU scheduling, memory, and storage management. In addition, this course will specifically introduce students to the Linux operating system, its commands and programming features.

RECOMMENDED TEXTBOOK:

- **Modern Operating Systems, 5th Edition** Andrew S. Tanenbaum; Herbert Bos

- **A Practical Guide to Linux Commands, Editors, and Shell Programming, 4th edition** Mark G. Sobell; Matthew Helmke

REQUIRED MATERIALS:

- Computer for implementation of Linux commands / system calls.

COURSE STUDENT LEARNING OUTCOMES (CSLO): Upon successful completion of this course the student will:

CSLO#1: Explain the structure and functions of operating systems, including their components, types, and operations.

CSLO#2: Analyze the performance of various scheduling algorithms used in operating systems.

CSLO#3: Understand and apply basic Linux commands for working with Linux Environment.

CSLO#4: Elaborate on the system calls used for process management, memory management and storage management in Linux.

PROGRAM STUDENT LEARNING OUTCOMES (PSLO):

The Computer Science Major will gain the following skills toward their major in the following PSLO categories.

- **PSLO #1:** Demonstrate proficiency in utilizing technology and information literacy skills to analyze and solve problems in computing environments.

- **PSLO #2:** Apply critical thinking and reading skills to evaluate and optimize the performance of operating systems and related algorithms.

- **PSLO #3:** Effectively navigate and utilize Linux operating systems and commands to accomplish computing tasks efficiently.

- **PSLO #4**: Synthesize knowledge of system calls and operating system structures to design and implement solutions for process, memory, and storage management challenges in Linux environments.

INSTITUTIONAL LEARNING OUTCOMES (ILO):

ILO 2: Technology and Information Literacy

ILO 5: Critical Thinking and Reading

ASSESSMENT CRITERIA & ALIGNMENT

CSLOs	PSLOs (indicate #only)	ILOs (indicate #only)	Assessment Methods
1	1,2	2,5	Embedded questions in quizzes, exams and assignments
2	2	5	Class discussions and embedded questions in quizzes, exams, and mini projects
3	1,3	2	Practical assessments in lab sessions, quizzes and tests, programming assignments
4	4	2	Written assignments, programming assignments and class discussions

CALCULATION OF FINAL GRADES:

The final average score will be calculated based on points earned on tests and assignments and in-class work and attendance, using a weighted average formula shown.

Test #1	20%
Test #2	20%
Final Exam:	20%
Class Participation* (includes in-class assignments, quizzes and exercises)	20%
Projects	20%
Total	**100%**

Note: Points will be deducted from late assignments and projects, unless special permission is granted due to valid excuses. No test can be considered for make up without documentation and verified excuses. Assignments must be saved by students on Canvas (not by email, unless permitted by instructor) and students are responsible for submission of the work of their own.

* (**Class Participation**) The students who have excessive absences, but can provide valid excuses such as athletics situation, may need to arrange with the instructor to be evaluated based on a practical test in place of missed class participation at the discretion of the instructor.

GRADING SCALE:

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
GPA Points	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.0
%	100-93	92- 90	89- 87	86- 83	82- 80	79- 77	76- 73	72- 70	69- 67	66- 60	Below 60

SCHEDULE OF TOPICS COVERED

Topics	Tentative Schedule
1: Overview of Operating Systems Introduction, operating-system structures, Linux basic commands, command-line interface (shell)	Weeks 1, 2
2: Process Management Processes, threads, synchronization, algorithms and deadlocks, process management system calls in Linux	Weeks 3, 4
3. CPU Scheduling Scheduling algorithms, scheduling in Linux	Weeks 5, 6, 7
4: Memory Management Main memory and virtual memory, page replacement algorithms, segmentation, memory management system calls in Linux	Week 8, 9, 10
5: Storage Management Storage structure, file-system interface, file-system implementation and management, I/O systems, file-system and I/O system calls in Linux	Weeks 11, 12
6: Advanced Topics Protection, Security, Virtual machines and distributed systems	Weeks 13, 14
Fall Break (No Class)	Week 15

COMMUNICATION POLICY:

Email me via canvas and include **CSC-3055** in the subject line!

Expect to receive a reply to questions (grading, debugging questions, etc.) within 1 business day and feedback on assignments or grades within 1 week of the latest due date.

ATTENDANCE POLICY:

Lincoln University uses the class method of teaching, which assumes that each student has something to contribute and something to gain by attending class. It further assumes that there is much more instruction absorbed in the classroom than can be tested on examinations. Therefore,

students are expected to attend all regularly scheduled class meetings and should exhibit good faith in this regard. For the control of absences, the faculty adopted the following regulations:

1. *Four* absences may result in an automatic failure in the course.
2. *Three* tardy arrivals may be counted as one absence.
3. Absences will be counted starting with whatever day is specified by the instructor but not later than the deadline for adding or dropping courses.

In case of illness, death in the family, or other extenuating circumstances, the student must present documented evidence of inability to attend classes to the Vice President for Student Affairs and Enrollment Management. However, in such cases, the student is responsible for all work missed during those absences.

Students representing the University in athletic events or other University sanctioned activities will be excused from class (es) with the responsibility of making up all work and examinations. The responsible office will issue the excuse note to the instructor.

LATE POLICY:

a. Assignments and/or Projects:
You can submit an assignment up to three days after it is due (in normal circumstances). The first day it is late, it is 5% off your grade. The second day, an additional 5% is lost. On the third and final day, 10% will be lost. Example, if homework is due on the 1st at 11:59pm, the very last time it can be submitted is the 4th at 11:59 pm and a total of 20% will be deducted from the grade you earned.

b. Quizzes and Tests:
You have a week from the day a quiz or test is given to communicate with me to establish a day to make it up. If you fail to make up the quiz/test on that day, you will receive a 0. If you do not talk to me within the week after it was originally given, you will receive a 0.

STUDENTS WITH DISABILITIES STATEMENT:

Lincoln University is committed to non-discrimination of students with disabilities and therefore ensures that they have equal access to higher education, programs, activities, and services to achieve full participation and integration into the University. In keeping with the philosophies of the mission and vision of the University, the Office of Student Support Services, through the Services for Students with Disabilities (SSD) Program, provides an array of support services and reasonable accommodations for students with special needs and/or disabilities as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. The Services for Students with Disabilities Program seeks to promote awareness and a campus environment in which accommodating students with special needs and/or disabilities is a natural extension of the University's goal.

Any student with a documented disability should contact the Office of Student Support Services.

USE OF AI TOOLS:

I am aware of the power and use of generative AI tools widely available. As a computer scientist and technology user, I don't disregard the helpfulness of these rapidly developing technologies and I am fully aware that some students will use them.

Acceptable use of AI tools

> The use of generative AI tools (e.g., ChatGPT, Google Bard, Dall-e, etc.) is permitted in this course for the following activities:
> - Brainstorming and refining your ideas.
> - Fine-tuning your research questions.
> - Finding information on your topic.
> - Drafting an outline to organize your thoughts; and
> - Checking grammar and style.

Unacceptable use of AI tools

> The use of generative AI tools is not permitted in this course for the following activities:
> - Impersonating you in classroom contexts, such as by using the tool to compose discussion board prompts assigned to you.
> - Writing a draft of a writing assignment.
> - Writing entire codes, sentences, paragraphs or papers to complete class assignments.

You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contains misinformation or unethical content). Your use of AI tools must be properly documented and cited to stay within university policies on academic honesty. Any assignment that is found to have used generative AI tools in unauthorized ways, will be regarded as plagiarism and no grade will be awarded for that assignment. **If in doubt about permitted usage, please ask for clarification.**

UNIVERSITY ACADEMIC INTEGRITY STATEMENT:

Responsibilities and Standards

Students are responsible for proper conduct and integrity in all their scholastic work. They must follow a professor's instructions when completing tests, homework, and laboratory reports, and must ask for clarification if the instructions are not clear. In general, students should not give or receive aid when taking exams or exceed the time limitations specified by the professor. In seeking the truth, in learning to think critically, and in preparing for a life of constructive service, honesty is imperative. Honesty in the classroom and in the preparation of papers is therefore expected of all students. Each student has the responsibility to submit work that is uniquely his or her own. All of this work must be done in accordance with established principles of academic integrity.

Acts of Academic Dishonesty (Cheating)

Academic Dishonesty includes, but is not limited to:

- Copying, offering and/or receiving unauthorized assistance or information in examinations, tests, quizzes; in the writing of reports, assigned papers, or special assignments, as in computer programming; and in the preparation of creative works (i.e. music, studio work, art).
- The fabrication or falsification of data, results, or sources for papers or reports.
- The use of unauthorized materials and/or persons during testing.
- The unauthorized possession of tests or examinations.
- The physical theft, duplication, unauthorized distribution, use or sale of tests, examinations, papers, or computer programs.
- Any action that destroys or alters the work of another student.
- Tampering with grades, grade books or otherwise attempting to alter grades assigned by the instructor.
- The multiple submission of the same paper or report for assignments in more than one course without the prior written permission of each instructor.

Plagiarism

If a student represents "another person's ideas or scholarship as his/her own," that student is committing an act of plagiarism. The most common form of plagiarism among college students is the unintentional use of others' published ideas in their own work and representing these ideas as their own by neglecting to acknowledge the sources of such materials. Students are expected to cite all sources used in the preparation of written work, including examinations.

It is each student's responsibility to find out exactly what each of his/her professors expects in terms of acknowledging sources of information on papers, exams, and assignments. It is the responsibility of each faculty person to state clearly in the syllabus for the course all expectations pertaining to academic integrity and plagiarism. Sanctions peculiar to the course should also be explained in the syllabus.

Sanctions

Sanctions for violations of the academic integrity standards include:

- Warning: A written notice that repetitions of misconduct will result in more severe disciplinary action. The warning becomes part of the student's file in the Office of the Registrar and, if there is no other example of misconduct, is removed at the time of graduation.
- Failure for Project (exam, paper, experiment).
- Failure of Course (students may not drop or withdraw from the course after being informed of the charge of academic dishonesty).

The sanction for a first offense may be either a Warning or Failure for Project. The sanction for any additional offenses may be either a Failure of Project or a Failure of Course. For serious and repeat offenses, the University reserves the right to suspend or expel a student.

Appeals of Charges of Academic Dishonesty

The student may appeal against a charge of academic dishonesty within ten days of receiving notice of same. The appeal will be heard by the Juridical Review Committee. Files on violations of this academic integrity code will be kept in the Office of the Registrar.

Disorderly Conduct

Behavior that disrupts academic pursuits, substantially injures the academic reputation, or infringes upon the privacy, rights, or privileges of other persons is prohibited.

Respectful Conduct

- It is expected of all students to show respect, fairness and consideration.
- Arrive for class on time. Late class arrivals are disruptive and inconsiderate. Students who frequently arrive late may be asked not to return to class.
- Stay for the entire class. If you must leave early (for a valid reason), do so without causing a disruption. Sit near the exit and inform the instructor in advance if you must leave.
- Set on silent/vibrate mode: cell phones, pagers, iPods or other electronic devices not required for class. Use of cell phones, texting or checking messages is prohibited and the penalty of **5 points** will be deducted from the score of your next test. This rule will apply every time this happens.

TITLE IX STATEMENT:

The following person has been designated to handle inquiries regarding the non-discrimination policies: Gerard Garlic, Title IX Coordinator/Director of the Health and Wellness Center, room 126B, Lincoln University, 1570 Baltimore Pike, Lincoln University, PA 19352 (p) 484-7460000 or Office of Civil Rights, U.S. Department of Education, The Wanamaker Building, 100
Penn Square East, Suite 515, Philadelphia, PA 19107-3323, phone 215-656-8541, fax 215-6568605, email: ocr.philadelphia@ed.gov

POLICY ON ELECTRONIC DEVICES IN CLASSROOM:

Excessive use of electronic devices (particularly cell phones) in class can be disruptive to class and is prohibited during exams. However, in some extenuating circumstances, students may be excused to leave the class to make phone calls outside the classroom.

Note:
The instructor of a given section of the course may make some modifications to the evaluation as well as to the rest of the syllabi including but not limited to: the grade weights, number of tests, and test total points.